



## Spotlight Counts of Deer in the Big Meadows Area

### Introduction

Based on previous studies (Scanlon and Vaughan 1981) and observations of vegetative change (Virginia Natural Heritage Program, 1992), white-tailed deer have become increasingly abundant in many developed areas throughout the park. This is especially evident in the Big Meadows Area (the meadow, the campground, and areas adjacent to and between these two locations). Since fall 1999, resource management staff members have conducted nighttime spotlight counts in the Big Meadows Area (BMA). The purpose of this survey is to show long-term deer population trends and habitat usage in the BMA. Big Meadows Area deer densities have likely exceeded their biological carrying capacity for 21 years as evidenced by visible effects on the landscape. Visible effects include; defined browse lines, loss of native herbaceous ground cover, diminished woody regeneration, loss of ground-nesting songbird habitat, and an abundance of non-deer-preferred plant species dominating the landscape. Lack of hunting and predation on the deer population plus ongoing maintenance of grassy openings contributes to high relative deer densities in the BMA.

The BMA includes ideal deer habitat - a combination of meadow, mature forest, forest edge, old orchard, dense cover, and permanent water. For these reasons, the BMA can support more deer than a contiguous mature forest setting. However, at densities of roughly 200 deer per square mile they run a much higher risk of disease outbreak, elevated numbers of parasites, and winter die-offs (from starvation). Additionally, these deer are having an inappropriate amount of sustained grazing and browsing impact on the BMA. Deer and forest/meadow resources may be regarded as impaired.



*White-tailed deer graze in the Big Meadow (2003).*

### Management Needs

Long-term relative deer density information is needed in order to protect the rare plant communities, floral diversity, woody regeneration, ground-nesting songbird habitat, and the historic character in the BMA. This information in combination with deer exclosure studies will help us understand the dynamics of the Big Meadows deer herd and help us build a foundation for developing future management recommendations and options.



*Defined browse line on gray dogwood in the Big Meadow (2002).*

### Current Procedures

Resource Management staff members conduct weekly nighttime deer spotlight counts in the BMA from March-May and October-December. Staff survey deer by using a spotlights from a vehicle traveling seven to twelve mph over a predetermined survey area (an established 13 mile long route). The survey method consists of using a slow-moving four-door vehicle and three-person crew (one driver/recorder and two spotters) to spotlight deer with two 1,000,000 candle-power spotlights. Surveys start 25 minutes past official sunset and last roughly 2.25 hours. Spotlight counts are taken only when weather conditions permit and when no foliage is present on the vegetation. Counts are not conducted when visibility is poor due to rain, fog, or snow. Tally counters are used to count total deer per section of the survey. At the end of each section both left and right-side tally counts are added up to give total deer per section. Observers take note of how many deer are bedded or moving. Distinct deer, such as bucks, yearlings, and pie-balled deer can be counted mentally. Wildlife such as bobcats, coyotes, and bears can be documented in the Notes section.



## Spotlight Counts of Deer in the Big Meadows Area (continued...)

### What We Have Learned

- Fall nighttime spotlight counts from 1999- 2003 have yielded an average of 212 deer per square mile (n=49) in the BMA.
- Fall nighttime counts from 1999- 2003 have yielded relative deer densities ranging from 103- 451 deer per square mile.
- Spring nighttime spotlight counts taken from 2000- 2004 have yielded an average of 200 deer per square mile (n=33).
- Spring nighttime counts from 2000- 2004 have yielded relative deer densities ranging from 76- 331 deer per square mile.

The graph below shows a 5- year downward trend in relative deer densities in the BMA. However, given the cyclical nature of herbivore populations, this may turn out to be a typical down- turn in relative deer density. It will be interesting to see if BMA deer densities climb back up to 1999- 2001 levels in future years.

Comparing fall spotlight counts to spring counts, habitat usage generally drops off in spring in all areas except the Meadow proper. The new growth of grasses and forbs plus less severe weather in spring, likely attribute to this difference.

### Future Research

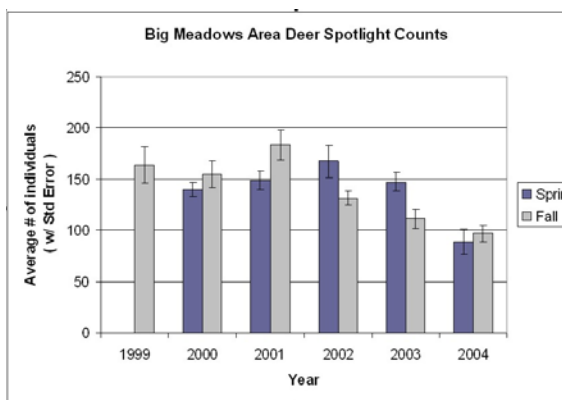
Spotlight surveys give us a good indication of relative deer density and population trends in the BMA. This study will be combined with a study to monitor the effects of sustained deer browsing on Big Meadows vegetation and rare plants (by constructing deer exclosures). These studies are essential if we want to protect the rare plant communities\*, floral diversity, songbird habitat, woody regeneration, and vulnerable landscape features in the BMA. Additionally, this information will help us understand the dynamics of the Big Meadows Deer Herd and help us build a foundation for developing future management recommendations and options.

\*Big Meadows contains 18% of the park's state- rare plant species (Report of the Virginia Department of Conservation & Recreation, Division of Natural Heritage).

### References

A Natural Heritage Inventory of Shenandoah National Park (Natural Heritage Technical Report #93- 5), February 1993. Division of Natural Heritage, Richmond, VA.

Scanlon, J.J., and M.R. Vaughan. 1981. Population and behavioral ecology of white- tailed deer in Shenandoah National Park, Virginia. Final Report to the National Park Service, MAR- 22. 74pp.



(Average number of deer/night in a 0.70 square mile survey area at BMA)